

## 4. REPTILIA AND BATRACHIA

BY

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WITH 1 PLATE.

### REPTILIA.

The knowledge about the herpetological fauna of the Kilimandjaro-Meru region is not very great as few collectors have operated there. It is the more gratifying to receive now at one time such a great number of species recorded from this interesting tract through the large collections of Professor YNGVE SJÖSTEDT which will be described in the following pages.

### Chelonia.

In the newest list of tortoises from German East Africa TORNIER<sup>1</sup> enumerates 5 species, but then he unites *Sternotherus nigricans* and *sinuatus* in one.

Professor SJÖSTEDT collected two species *Testudo pardalis* and *Pelomedusa galeata* in the Meru region. Both species are widely distributed in tropical Africa.

#### *Testudo pardalis* BELL.

*Testudo pardalis* BELL. BOULENGER Cat. Chelonians p. 160.

1 specimen with the length of the carapace about 23 cm. — 1 specimen about 24 cm. Near the river Ngare na nyuki in the shrubberies of the acacia forest, Meru low lands.

<sup>1</sup> Zool. Jahrb. Abth. f. Syst. Geogr. v. Biol. Bd 13 Jena 1900.  
*Sjöstedts Kilimandjaro-Meru Expedition. 4.*

**Pelomedusa galeata** (SCHOEPFF).

*Pelomedusa galeata* (SCHOEPFF). BOULENGER Cat. Chelonians p. 197.

1 small specimen from the river Ngare na nyuki.

The shields of the plastron of this specimen are anomalous as their number is 15; this is due to the fact that there are four femoral shields instead of two.

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## Lacertilia.

The number of lizards recorded from German East Africa amounts to between 70 and 80 species. The exact number is difficult to state as it depends upon whether some of the names have been given to real species or mere varieties and in some instances this can not yet be ascertained. The amount of variation in some, for instance *Gerrhosaurus*, appears to be very great. The collection brought home by Professor SJÖSTEDT contains about 30 different forms (in 141 specimens). A couple of these are, however, perhaps only varieties.

The Geckoes are represented in the collection by four species, all of which were known from Usambara before. Three of these, *Gonatodes africanus*, *Hemidactylus werneri* and *Lygodactylus conradti*, were collected by SJÖSTEDT at Kilimandjaro and the two latter at Meru, as well, for which region they were not recorded before. As some of the Geckoes recorded from German East Africa have a very wide distribution, it is most probable that they will also be found in the Kilimandjaro district later on, and it thus will be proved that this family is represented there by more species than the three mentioned above. The three members of the genus *Agama* which SJÖSTEDT has found at Kilimandjaro and Meru are all of them widely distributed. The same is the case as well with the two Varani, and *Latastia longicaudata* and *Nucras tessellata*. *Eremias spekii* seems to inhabit the greater part of German East Africa. But of great interest was the discovery of *Lacerta jacksoni* at Kilimandjaro and Mombo as it had only been found at the Mau Mountains in British East Africa before, and by this find it is proved that the genus *Lacerta* has found its way still further into the heart of Africa than ever was believed before.

From a zoo-geographical point of view the specimens of *Gerrhosaurus* are of less interest, but the more for the study of variation (conf. below).

The three Mabuias found by SJÖSTEDT in the Kilimandjaro-Meru region are all well known from East Africa, where several other species of this genus are at home. The two species of *Lygosoma* have a more restricted habitat, but both were known from Kilimandjaro before, although not from Meru. *Ablepharus wahlbergi* is a widely distributed species. Among the true lizards there is thus in this collection only *Lacerta jacksoni* which is of special importance from a zoo-geographical point of view.

The problem to solve is whether this interesting lizard of the *Lacerta muralis* group has pushed so far south in recent time, or if it is a relict from a time when the distribution of the genus *Lacerta* extended still further. The fact that this species hitherto has been found on isolated mountains speaks for the latter alternative.

Among the *Rhiptoglossa* the news are not so great. The collection contains 4 species from the Kilimandjaro-Meru region but they were all recorded from this tract before. 24 species of lizards are now on record from the Kilimandjaro-Meru region. Among the lizards from Usambara the huge *Chamaeleon melleri* is the most interesting.

Two species of Chamæleons viz. *Ch. dilepis* and *Ch. gracilis* the fauna of Kilimandjaro has in common with that of the isolated Cameroon mountain of West Africa. The latter fauna includes, however, not less than five endemic Chamæleons and is thus much more sui generis than the fauna of Kilimandjaro.

On the whole there is, however, a greater number of lizards in the Kilimandjaro region than in the Cameroon territory and that depends upon that the former is a more open and dry country which is more suitable for lizards. The same is also proved by the components of the fauna. In Cameroon there are only two members of the family *Lacertidæ* viz. *Lacerta echinata* and *Holaspis guentheri* (also found in East Africa) while there are four at Kilimandjaro and several more in adjacent parts of East Africa. Cameroon has only one *Agama (colonorum)* which is widely distributed but 3 species of that genus live at Kilimandjaro and many more in adjacent parts of East Africa.

On the other hand there are two *Auphisbenidæ* known from Cameroon but none from Kilimandjaro.

### Fam. Geckonidæ.

#### *Gonatodes africanus* (WERNER).

*Gymnodactylus africanus* WERNER. Verh. K. K. Zool. bot. Ges. Wien. 45 Bd. 5 Hft p. 190.

1 defect specimen <sup>21</sup>/<sub>7</sub> 1905 Kibonoto. — 1 specimen Aug. 1905 Kibonoto at Kilimandjaro. — 1 specimen from the Mkulumusi caves near Tanga, July 1905. — 2 specimens from the farms, Kibonoto, Nov. 1905. — 1 specimen caught on a tree in the farm at Kibonoto, Jan. 1906.

This species is before this described from Usambara.

#### *Hemidactylus wernerii* TORNIER.

*Hemidactylus bocagei* TORNIER. Thierwelt Ost-Afrikas Lief. III Reptil. p. 12.

*Hemidactylus wernerii* TORNIER. Arch. Naturgesch. Jahrg. 63, Bd. I p. 63.

1 specimen from the acacia forest at the river Ngare na nyuki, Meru low lands Nov. 1905.

This specimen has 13 præanal pores and agrees in other respects with TORNIER'S description of this species.

To the same species appear to belong: 1 specimen from the Massai steppe. — 2 specimens caught under stones on the Massai steppe, Kibonoto, <sup>28</sup>/<sub>8</sub> 1905. — 1 specimen, Kibonoto, Oct. 1905.

This species was described by TORNIER from Dalalani.

*Lygodactylus picturatus* PETERS.

*Lygodactylus picturatus* PETERS. BOULENGER Cat. Lizards I, p. 161.

1 male specimen from Usambara June 1905. — 1 specimen from Tanga <sup>4</sup>/<sub>6</sub> 1905. Often seen running on the trunks of palms.

Known from Zanzibar to British East Africa.

*Lygodactylus conradti* MATSCHIE.

*Lygodactylus conradti* MATSCHIE. Sitzber. Ges. Naturf. Freunde, Berlin. Jahrg. 1892 p. 109.

1 specimen caught in the tent, Kibonoto <sup>15</sup>/<sub>7</sub> 1905. — 2 specimens from Kibonoto, Oct. 1905. — 2 specimens from the acacia forest at the river Ngare na nyuki, Meru low lands, Jan. 1906.

These specimens agree perfectly with MATSCHIE'S descriptions (1892) and TORNIER'S remarks (1896) to the same. The colour is somewhat variable, some specimens having a series of black spots on the flanks, others not. In all the specimens it looks as if the mental was compound of three plates. Originally described from Usambara.

Fam. Agamidae.

*Agama doriae* BOULENGER.

*Agama doriae* BOULENGER. Ann. Mus. Civico Stor. Nat. (2) Vol. II. 1885.

2 specimens from the tract at Ngare na nyuki, Meru low lands <sup>20</sup> <sup>30</sup>/<sub>11</sub> 1905. — 1 specimen caught on a big stone on the Massai steppe <sup>8</sup>/<sub>9</sub> 1905, Kibonoto.

Very similar to *A. colonorum*. It has been collected by NEUMANN at Nguruman and other places. Originally it was described from Abyssinia and has also been found in the Somaliland and has thus a wide distribution.

*Agama planiceps* PETERS.

*Agama planiceps* PETERS. BOULENGER Cat. Lizards I p. 358.

1 specimen, Ngare na nyuki, Meru steppe, <sup>20</sup> <sup>30</sup>/<sub>11</sub> 1905. — 1 specimen in acacia forests, Ngare na nyuki, Jan. 1906.

This species is widely distributed.

*Agama atricollis* SMITH.

*Agama atricollis* SMITH. BOULENGER Cat. Lizards I p. 358.

4 specimens from Ngare na nyuki, Meru steppe <sup>20</sup> <sup>30</sup>/<sub>11</sub> 1905. — 1 specimen from the acacia forests at the river Ngare na nyuki, Meru low lands, Jan 1906, usually on volcanic rocks.

This species is widely distributed and also found at many places in German East Africa.<sup>1</sup>

### Fam. Varanidae.

#### *Varanus niloticus* (LINNÉ).

*Varanus niloticus* (LIN.). BOULENGER Cat. Lizards II p. 317.

2 specimens. Tanga.

#### *Varanus ocellatus* RÜPPEL.

*Varanus ocellatus* RÜPPEL. BOULENGER Cat. Lizards II p. 308.

1 specimen from the steppe with acacia forests near the river Ngare na nyuki. Dec. 1905.

This species was originally described from Abyssinia, but it was already known before that its distribution extended so far south as to Usambara.

### Fam. Lacertidae.

#### *Lacerta jacksoni* BOULENGER. (*kibonotensis* n. subsp?)

*Lacerta jacksoni* BOULENGER. Proc. Zool. Soc. 1899 p. 96.

1 fine specimen caught on the trunk of a tree, Kibonoto <sup>22</sup>/<sub>9</sub> 1995. — 1 specimen from a banana plantation, Kibonoto <sup>6</sup>/<sub>4</sub> 1906. — 3 specimens from Kibonoto, caught in May 1906. — 1 specimen from Mombo, Usambara, June 1906.

It was of great interest to receive some specimens of this kind of lizards which originally was described by BOULENGER on a single male specimen »from Ravine station, Mau Mountains on the main route from Mombasa to lake Victoria at an altitude of 7,500 feet». Through Professor SJÖSTEDT's specimens from different localities the species is proved to have a considerable distribution and not to be confined to a single mountain range.

There is very little discrepancy between the Kibonoto specimens and BOULENGER's description and figures except the following. One of the former specimens has 5 labials on one side, and 4 on the other, in front of the subocular. The collar is composed of 7 or 8 plates (10 in the type) the outer of which on either side is rather small. In the Mombo specimen the collar consists of 8 plates and the interparietal is anomalous being transversally divided into two plates. The latter is also the case with a specimen from Kibonoto. In his description<sup>2</sup> BOULENGER says »temple granular». With regard to these specimens the word granular appears to be less suitable as the scales in the corresponding region of the present specimens are, although irregular, larger than the dorsal scales. To judge from BOULENGER's figure the scales of the temporal region of the type-specimen appear to be smaller and consequently more numerous than in the specimens from Kibonoto. Thus in the figure 8 rows

<sup>1</sup> TORNIER. Reptilien, Thierwelt Ost-Afrikas.

<sup>2</sup> Proc. Zool. Soc. London 1899 p. 96—97.

of scales may be counted between the parietal and the labials and each such row contains about 9—11 scales, but in the specimens from Kibonoto the corresponding numbers are 5—6 (7) and 6—7 (8). If all these small differences are constant, — which, however, can not be proved as the typical form only has been found in one specimen — the specimens from Kibonoto appear to belong to a somewhat aberrant geographical subspecies for which I take the liberty of proposing *kibonotensis* as a third name. A direct comparison might then also reveal some other small characteristics.

From the forest east of Kagera River in German East Africa TORNIER described 1902 a lizard which he named *Lacerta vaureselli* and regarded to be related to *L. jacksoni* BOULENGER. TORNIER'S lizard differs from *L. jacksoni* and the lizard from Kibonoto in having 11 plates in the serrated collar but no gular fold, only 8 femoral pores, and only 6 series of ventral plates. They are thus easily distinguished from each other.

***Nucras tessellata* (SMITH).**

*Nucras tessellata* (SMITH). BOULENGER Cat. Lizards III p. 52.

1 specimen from the hot and sunny grass steppe at the river Ngare na nyuki, Meru low lands <sup>23</sup>/<sub>10</sub> 1905.

***Latastia longicaudata* (REUSS).**

*Latastia longicaudata* REUSS. BOULENGER Cat. Lizards III p. 55.

2 specimens from the acacia forest near Ngare na nyuki.

This lizard is widely distributed in East Africa from Abyssinia to Unyamwesi.

***Eremias spekii* GÜNTHER**

*Eremias spekii* GÜNTHER. Ann. Mag. Nat. Hist. (4) 1 1872.

2 specimens from the acacia forest in the Meru low lands <sup>24</sup>/<sub>11</sub> 1905.

•Frequenting open, sunny and sandy places, running with great speed. When scared they hide in holes in the earth. — 2 specimens from the acacia forest at the river Ngare na nyuki, Meru low lands, <sup>20</sup> <sup>30</sup>/<sub>11</sub> 1905.

2 specimens from Mombo, Usambara, June 1906.

**Fam. Gerrhosaurida.**

***Gerrhosaurus nigrolineatus* HALLOW.**

*Gerrhosaurus nigrolineatus* HALLOW. BOULENGER Cat. Lizards III p. 122.

1 specimen (together with *Latastia longicaudata*) from Ngare na nyuki.

***Gerrhosaurus flavigularis* WIEGMANN.**

*Gerrhosaurus flavigularis* WIEGMANN. BOULENGER Cat. Lizards III p. 122.

A large specimen, measuring 367 mm. in total length, from Ngare na nyuki. The præfrontals just touch each other in this specimen.

**Gerrhosaurus flavigularis** WIEGMANN.(Pl. I Fig. 1 a & b) forma *intermedia*.

A fine specimen, nearly 400 mm. although the tip of the tail has been broken and partly reproduced, caught on the steppe near the Natron lakes, Kibonoto <sup>6</sup>/<sub>8</sub> 1905.

This animal differs as well from *G. nigrolineatus* as from *flavigularis* with which it may be related, if these two species are held apart and not united as TORNIER has done lately.<sup>1</sup>

The present specimen has a long suture between the præfrontals as in *G. nigrolineatus*, but only 22 series of dorsal scales all of which, even those of the flanks are strongly keeled. The full description is as follows: Head shields smooth. Nasals in contact behind rostral. Frontonasal as broad as long. Præfrontals with a long median suture. Frontal much shorter than fronto-parietal and parietal together. A narrow tympanic shield. Interorbital breadth posteriorly across the third supraoculars contained 2 <sup>1</sup>/<sub>2</sub> times in the distance between tip of snout and ear-opening. 22 series of scales all strongly keeled and also provided with smaller lateral keels. 52 shields between the chinshields and the large præanal shield. 14 femoral pores.

Dark brown above with three yellowish white dark-edged stripes, the median narrowest. Sides minium red with dark bars extending from the back. These are at first 2 scales broad but lower down on the flanks only one scale broad. Across these bars there are short longitudinal yellowish white stripes on each scale.

The differences from the descriptions of *G. nigrolineatus* and *G. flavigularis* are thus very conspicuous, but as TORNIER (l. c.) has described from Dar-es-salaam fully intermediate forms between both these supposed species, it appears difficult to maintain them. The best thing may therefore be to use the oldest name *G. flavigularis* for all and distinguish the different varieties with a third name until the matter is still better elucidated by greater collections from different localities.

**Fam. Scincidae.*****Mabuia comorensis*** (PETERS).

*Mabuia comorensis* (PETERS). BOULENGER Cat. Lizards III p. 163,

1 specimen from Mombo, Usambara, June 1906.

***Mabuia megalura*** (PETERS).

*Mabuia megalura* (PETERS). BOULENGER Cat. Lizards III p. 1905.

1 fine specimen found in a shrub on the Massai steppe near the Natron lakes <sup>6</sup>/<sub>8</sub> 1905. — 1 specimen with reproduced tail found among grass in the mixed forest (»Mischwald») Kibonoto <sup>3</sup>/<sub>11</sub> 1905.

<sup>1</sup> Zool. Jahrb.: Abth. Syst. Bd. 13, Jena 1901.

Both these specimens are similar in colour-pattern and disagree with the descriptions in having 4 black dorsal stripes, the 2 median of which disappear without having joined on the tail to a median azygous stripe. They extend about 1 1/2 cm. on the tail and end there without having even converged. The lateral stripes are broader and extend to the tip of the tail. On the flanks of the body they appear to have a tendency to break up each in two.

4 similar specimens, Kibonoto, May 1906.

*Mabuia varia* (PETERS).

*Mabuia varia* (PETERS). BOULENGER Cat. Lizards III p. 202.

1 specimen found below a stone on the steppe at the river Ngare na nyuki, Meru low lands <sup>25</sup>/<sub>11</sub> 1905. — 1 specimen from the upper part of the *Ericinella*-region, 3,500 m. above the sea level, Kiboseho, <sup>15</sup>/<sub>2</sub> 1906.

The latter specimen is somewhat aberrant in having the nuchal scales mostly quadricarinate, but as this is a characteristic subjected to variation I have referred it to *M. varia* with which it otherwise agrees in essential characteristics and appearance.

*Mabuia striata* (PETERS).

*Mabuia striata* (PETERS). BOULENGER Cat. Lizards III p. 204.

2 specimens <sup>21</sup>/<sub>7</sub> 1905 Kibonoto, found »running on stems of trees». — 1 specimen <sup>27</sup>/<sub>7</sub> 1905 Kibonoto. — 1 specimen <sup>25</sup>/<sub>7</sub> 1905 Kibonoto. This specimen is anomalous, having a double or rather forked tail. — 5 specimens <sup>6</sup>/<sub>9</sub> 1905 Kibonoto. — 1 specimen near the river Ngare na nyuki, Meru low lands. — 3 specimens, the same locality. — 3 specimens Kibonoto, May 1906.

»The most common of all lizards, often seen running on the huts of the natives in the same manner as *Agama colonorum* in West Africa. Also running on stems of trees and hiding in holes in the same».

*Lygosoma modestum* (GÜNTHER).

*Lygosoma modestum* GÜNTHER. BOULENGER Cat. Lizards III p. 306.

4 specimens from termite hills Kibonoto, May 1906. — 5 specimens from the acacia forest near the river Ngare na nyuki, Meru low lands Jan. 1906. — 1 small specimen the same locality and date.

2 specimens from the same locality caught in Nov. 1905 are a little larger (resp. 110 and 140 mm.) and less uniformly coloured. The blackish dots on the head shields are more conspicuous and the central blackish streaks of the scales of the back and the sides are more numerous and more defined and they extend not only over the dorsal surface of the tail but are also to be seen on the lower surface of that organ, although somewhat less distinct. Otherwise they are typical *L. modestum* and agree with the description with regard to lepidosis, relative dimensions etc. This species was known from Kilimandjaro before.



**Lygosoma kilimensis** STEJNEGER.

*Lygosoma kilimensis* STEJNEGER. Proc. U. S. Nat. Mus. Vol. 14 p. 405.

1 specimen from the neighbourhood of Ngare na nyuki. — 1 small specimen from Kibonoto caught in Oct. 1905. — 1 specimen from a banana farm, Kibonoto <sup>16</sup>/<sub>11</sub> 1905. This specimen is better streaked on the lateral scales than the foregoing.

1 specimen <sup>30</sup>/<sub>9</sub> 1905 Kibonoto. »Caught on the ground among grass». This specimen is also well streaked on the flanks and sides of the tail, that is the unbroken, not reproduced part of this organ. It is evident that this species is rather long-tailed, although as a rule more or less of the tip has been broken off and reproduced. But in this specimen the tail (including 25 mm. reproduced at the tip) measures 86 mm. while the length of head and body is 55 mm. only.

1 specimen from banana plantations Kibonoto <sup>6</sup>/<sub>8</sub> 1905. Length of head and body 72 mm., length of tail, partly reproduced 94 mm. The streaks of the scales form continuous longitudinal bands on the flanks.

It is interesting to see how the reproduced parts of the tail of this lizard have a different lepidosis with large transversal shields across the lower surface and a series of enlarged scales along the dorsal surface as well, instead of the normal scales. In this respect it differs entirely from *L. modestum* which has no enlarged shields on the lower surface of the reproduced tail.

**Ablepharus wahlbergi** (A. SMITH).

*Ablepharus wahlbergi* (A. SMITH). BOULENGER, Cat. Lizards III p. 330.

Eighteen specimens, Oct. 1905, Kibonoto. — 9 specimens <sup>24</sup>/<sub>8</sub> Kibonoto.

»Run extremely swiftly, caught under stones on the steppe».

1 specimen <sup>23</sup>/<sub>10</sub> 1905. »On the glowing hot grass steppe near the river Ngare na nyuki».

The interparietal exhibits a good deal of variation in size etc. in these specimens. Sometimes it is very small, sometimes it is more or less confluent with the frontoparietal. In a few specimens this confusion is quite complete so that the interparietal and frontoparietal form only one shield, in others part of the sutures remain.

**Rhoptoglossa.****Fam. Chamaleontidae.****Chamaleon gracilis** HALLOW.

*Chamaleo gracilis* HALLOW. WERNER, Zool. Jahrb. Syst. Bd. 15 p. 336.

1 specimen from Meru 3,000 m. above the sea <sup>21</sup>/<sub>12</sub> 1905 in the so called »rain-forest» (Regenwald).

WERNER reports (l. c.) that this widely distributed chamæleon has been found between Mombasa and Kilimandjaro.

**Chamæleon dilepis LEACH.**

*Chamæleon dilepis* LEACH. WERNER, Zool. Jahrb. Bd. 15 p. 338.

5 specimens  $\frac{6}{9}$  1905. — 4 specimens  $\frac{7}{7}$  1905. — 3 specimens Aug. 1905. — 2 specimens July—Aug. 1905. — 4 specimens May—June 1906, Kibonoto, Kilimandjaro.

Among the last mentioned ones were 2 females containing rather large eggs.

Concerning this species Prof. SJÖSTEDT has communicated the following notes from his diary: »On a leafy branch the poor being has chosen its place, its lower side is pressed to the top surface of the branch and the feet clasp, with their sharp claws, the sides. The tail is stretched backward, its tip hanging free and rolled up spirally. Quite immovable the animal sits there, not a particle of the contours of the body changes, it looks as if cast in some metal. Only the eyes move, independently of each other, scanning the surroundings, they roll now to this, now to the other side, sometimes resting to scrutinize something more carefully. To agree with the surroundings the animal has assumed a light green colour only showing along the flanks a rusty reddish streak as a kind of »lateral line«. As soon as it is touched, however, it is suddenly changed as if touched with a wizards wand. The whole animal from snout to tip of tail is covered with densely set dark spots of the size of hempseed. To begin with they are shadowy but soon become so sharply confined that it looks as if the animal had smallpox. The rusty red lateral streak and three scattered but well defined spots on the neck, breast and inguinal region have assumed a pale violet shade. Some little pronounced, dark clouds appear and disappear again.

If the animal is left in peace the dark spots and weakly developed clouds assume a dark green colour and become by and by lighter, first the clouds then the small round spots till the animal has resumed its light grass green colour which it had when first observed. (A female with 24 eggs, white,  $24 \times 10$  mm.) Not far from this another chamæleon of the same size was seen but with larger occipital lobes and a somewhat higher parietal crest. The whole animal is on light green ground largely and sharply panther-spotted with blackish green irregular clouds, small spots of the size of hemp-seed in the green areas between the large clouds. The blackish green spots extend to the tip of the tail, forming along the tail and the back a dozen more regular patches. Radiating streaks on the lid from the opening for the pupil give a peculiar appearance to the animal. It is thus quite different from the other, and has the warning colour of the gular folds, which it shows with a hissing sound, open mouth and inflated throat, darker orange-yellow. — After a while it becomes like the other green as a leaf with spots, and the lateral streak light. When touched the small spots began to appear as pale rusty red changing to dark green. In less than a quarter of a minute the panther spotted appearance was fully developed.

But other colour changes may be seen as well. One morning, when the grass green female with its rusty reddish lateral streak was touched, the body darkened

to almost bluish grey, the small black spots began to appear. In a few moments the dark cloud over the skin disappeared and the whole animal became grass green, densely beset with sharply defined dark spots of the size of a hemp-seed. After a few minutes of rest these have again disappeared and the green ground colour prevails. When touched again it was scattered all over with yellow spots of hemp-seed size which before my eyes rapidly changed to dark, and at the same time the great dark clouds put in appearance.

The male is nearly always cloudy and had, to match the dark surroundings of the station house, assumed a stone brown ground colour, between the clouds, soon changing to green, not so clear and light, however, as in the female. Sometimes the whole animal was uniformly stone brown as gneis, with a rusty reddish lateral band.»

BÖHM has also observed the colour changes of this species and tried to discern three local varieties according to the colour.<sup>1</sup> Strange enough the description by SJÖSTEDT (conf. above) agrees best with BÖHM's »Form. I» which is STUHLMANN'S »Küstenform».

#### *Chamaeleon biteniatus* FISCHER.

*Chamaeleon biteniatus* FISCHER. Jahrb. wiss. Anst. Hamburg f. 1883, p. 83.

2 specimens from Kiboscho, Kilimandjaro, mountain meadows above the forest region, 3,000 m. above the sea, Febr. 1906.

The flat tubercles on the sides form two distinct bands in the larger specimen, but no knob is found on the snout. Dorsal crest formed by groups of 2—4 enlarged scales. Head and anterior part of body dark, flanks towards the lumbo-sacral region and belly clouded with lighter.

Length from snout to vent about 58 mm. in the larger specimen.

This species appears to be a real mountain loving chamaeleon as it has been recorded not only from Kilimandjaro before (VOLKENS conf. TORNIER f. c.) but also from other places, as for instance, Leikipia 6,000 feet», Mau Mountains, Gurni 3,000—3,200 m. etc.

#### *Chamaeleon biteniatus* FISCHER n. var.

1 specimen Kibonoto, Kilimandjaro.

This specimen resembles *Ch. b. elioti* (GÜNTHER) in having the parietal crest divided anteriorly in three rows of tubercles, the lateral of which diverge from the median one towards the superciliary ridges. About every fourth of the conical tubercles forming the dorsal crest is larger than the others.

Large flat tubercles form on either side two continuous longitudinal bands, but in addition to this a great number of flat tubercles are intermixed with smaller and larger granules of all sizes which constitute the lepidosis of this chamaeleon. The gular and ventral crests are formed by rather blunt and flattened tubercles. No knob

<sup>1</sup> Conf. TORNIER Reptilien p. 48 in Die Thierwelt Ost-Afrikas.

on the snout. The length of the mouth is shorter than the height of the casque from the corner of the mouth.

The head and legs are rather dark but the other parts have a yellowish grey ground colour with a series of dark blotches on the back, and on either side a series of dark triangular spots with their bases at the upper lateral band and the tips downwards.

As this specimen differs from all four varieties of *Ch. biteniatus* hitherto recognized, it might deserve to be distinguished with a separate third name but as the variability of the chameleons is very great, one specimen is too little for a new name. From *Ch. b. elioti* (GÜNTHER) it differs in having two distinct lateral bands, from *Ch. b. biteniatus* by the strong development of the lower lateral band and by the shape of the tubercles of the gular and ventral crests, otherwise it is most closely related to that variety; from the two others it differs by the absence of a knob on the snout. Distance from snout to vent about 60 mm.

Another specimen is somewhat darker but otherwise pretty similar.

*Chamaeleon taretensis* STEINDACHNER.

*Chamaeleon taretensis* STEINDACHNER. WERNER, Zool. Jahrb. Syst. Bd. 15 p. 418.

3 specimens, Ngare na nyuki, Meru low lands. — 2 male specimens, Kibonoto. — 1 female specimen, Kibonoto, July—Aug. 1905. — 1 male specimen, Kibonoto, May—June 1906.

This species is recorded from Kilimandjaro before.

*Chamaeleon melleri* GRAY.

*Chamaeleon melleri* GRAY. WERNER, Zool. Jahrb. Syst. Bd. 15 p. 421.

A splendid specimen measuring 545 mm. in total length, found in a forest with tall but not dense trees at Mombo, Usambara.

In a living state the animal was very light greenish yellow, almost uniform. In spirit it has retained the light yellow tint to some extent.

*Rhampholeon kersteni* (PETERS).

*Rhampholeon kersteni* (PETERS). WERNER, Zool. Jahrb. Syst. Bd. 15 p. 430.

1 specimen 4/6 1905, Tanga, Usambara. — 2 specimens Mombo, Usambara, June 1906.

## Ophidia.

Between 60 and 70 species of snakes are recorded from German East Africa. By the addition of Professor YNGVE SJÖSTEDTS collections, the fauna of the Kilimandjaro-Meru district has reached to about half this number or exactly 30 species. 19 species of snakes have been collected by SJÖSTEDT (in 85 specimens). Some of these were of course recorded from Kilimandjaro before. The remaining 11 by others, chiefly by G. A. FISCHER and JACKSON.

Concerning the geographical distribution of the snakes which have been found in this region and of which a list is appended below, the following remarks may be made. The members of the genera *Typhlops*, *Glauconia* and *Python* are all widely distributed in tropical Africa. The same is also the case with the representatives of the genera *Tropidonotus*, *Boodon*, *Philothamnus*, *Homalosoma*, *Dasypeltis*, *Leptodira*, *Amplorhinus*, *Thelotornis*, *Elapechis*, *Naja*, *Causus*, and *Bitis*, and the species *Lycophidium capense*, *Psammophis sibilans*, and *Dendraspis angusticeps*. Chiefly confined to East Africa but rather widely distributed there are the members of the genera *Chlorophis* and *Coronella*, the remaining three species of *Psammophis*, and *Aparallactus concolor*. *Lycophidium jaeksoni* has been found only within the borders of German East Africa, and *Rhamphiophis rubropunctatus*, and *Aparallactus jaeksoni* have as yet only been collected at Kilimandjaro.

Among the snakes there are thus only a few forms which may be regarded as endemic in this region and nearly all the others are at home almost everywhere in suitable places in tropical Africa.

A comparison between the ophidian fauna of Kilimandjaro and that of Cameroon in West Africa is of a certain interest as it shows as well that some species are common to both and in other instances there are corresponding members of the same genera. The following species of snakes belong to both these distant regions *Typhlops punctatus*, *Python sebæ*, *Dasypeltis seabra*, *Leptodira hotambæia*, *Philothamnus semivariegatus*, *Thelotornis kirtlandi*, *Naja melanoleuca*, *N. nigricollis*, *Dendraspis angusticeps*, *Causus rhombeatus* and *Bitis arietans*.

The analogous forms may be matched as follows:

| Cameroon.  | Kilimandjaro.         |
|--|-----------------------|
| <i>Tropidonotus fuliginoides</i>                 | <i>T. olivaceus</i>   |
| <i>Boodon olivaceus</i> & <i>virgatus</i>        | <i>B. lineatus</i>    |
| <i>Lycophidium</i> 5 species                     | <i>L. capense</i>     |
| <i>Chlorophis irregularis</i> & <i>carinatus</i> | <i>Chl. neglectus</i> |
| <i>Dendraspis jamesoni</i>                       | <i>D. sjöstedti</i>   |

From a biological point of view this comparison could be extended still further. Although the following snakes belong to different genera they may occupy similar places in nature. The small opisthoglyphous genera *Miodon* and *Elapops* from Cameroon, and *Aparallactus* from Kilimandjaro.

With our present knowledge there are, however, not far from twice as many species of snakes known from Cameroon as from Kilimandjaro. There is especially a greater variety of tree-snakes in the former region in correspondence to the greater abundance of forests there.

### Fam. Typhlopida.

#### *Typhlops punctatus* (LEACH)

*Typhlops punctatus* (LEACH). BOULENGER, Cat. Snakes I p. 42.

3 specimens from Kibonoto 1905. — 3 more from the same locality collected in May 1906.

These blind snakes were sometimes found on the foot paths on the surface of the ground. The species has been recorded from Kilimandjaro before.

### Fam. Glauconiidae.

#### *Glauconia scutifrons* (PETERS).

*Glauconia scutifrons* (PETERS). BOULENGER, Cat. Snakes I p. 68.

1 specimen from the steppe with acacias near the river Ngare na nyuki in the Meru steppe Nov. 1905.

This species has not been found on Kilimandjaro before but this is the case with the related *Gl. conjuncta*.

### Fam. Boidae.

#### *Python sebae* (GMELIN).

*Python sebae* (GMELIN). BOULENGER, Cat. Snakes I p. 86.

1 specimen from Kibonoto, Aug. 1905. The two foremost upper labials deeply, the third feebly pitted. — 1 specimen Kibonoto with labials normally pitted.

### Fam. Colubridae.

#### *Boodon lineatus* (DUM. & BIBR.)

*Boodon lineatus* (DUM. & BIBR.) BOULENGER, Cat. Snakes I p. 332.

12 specimens from Kibonoto July—August 1905. (The following dates especially recorded  $^{11}/7$ ;  $^{15}/7$ ;  $^{29}/7$ ;  $^1/8$ ;  $^5/8$  1905). — 1 small specimen from the same locality collected in November 1905. — 2 specimens from Ngare na nyuki in the Meru low lands. — 1 specimen from Mombo, Usambara, June 1906. — 3 specimens from Kibonoto May 1906. 1 small young not measuring more than about 12  $\frac{1}{2}$  cm.

Small specimens of this kind were often found under the bark of tree trunks lying on the ground.

This appears to be the most common of all snakes in this district, where it has been collected several times before.

**Lycophidium capense (SMITH).**

*Lycophidium capense* (SMITH). BOULENGER, Cat. Snakes I p. 336.

2 specimens from Kibonoto, caught resp.  $^{13}/_8$  and  $^{28}/_8$  1905, the latter found under stones on the Massai steppe. — 1 specimen from Ngare na nyuki in the Meru low lands.

This snake has been found at Kilimandjaro before.

**Chlorophis neglectus (PETERS).**

*Chlorophis neglectus* (PETERS). BOULENGER, Cat. Snakes II p. 94.

4 specimens from Kibonoto, collected in July and August (one specimen is labelled  $^{16}/_7$ , another  $^4/_8$ ) 1905.

A fifth smaller specimen is labelled »Kibonoto, cultivated zone, July 1905».

**Philothamnus semivariegatus (SMITH).**

*Philothamnus semivariegatus* (SMITH). BOULENGER, Cat. Snakes II p. 99.

3 specimens from Kibonoto July—Aug. 1905.

Recorded from Kilimandjaro before.

**Dasypeltis scabra (LINNÉ).**

*Dasypeltis scabra* (LINNÉ). BOULENGER, Cat. Snakes p. 354.

1 fine specimen from the Meru lakes collected the  $^{30}/_7$  1905.

The resemblance in colour pattern between this snake and *Causus rhombecatus* is very striking in this specimen so that it could be full reason to speak of mimicry. 1 good specimen caught on a path in the steppe with scattered trees in June 1905 is dull brick-red above without any markings at all except that in a few places the bases of the scales show a narrow whitish margin. Below the snake is whitish with a brick-red tint anteriorly.

A third specimen caught at Kibonoto in May 1906 is uniformly dull brown with faint cross bars of a darker brown anteriorly, belly finely mottled.

This species has been found at Kilimandjaro before.

**Leptodira hotamboeia (LAURENTI).**

*Leptodira hotamboeia* (LAURENTI). BOULENGER, Cat. Snakes III p. 89.

4 specimens collected at Kibonoto in July (resp.  $^1/_7$ ,  $^{21}/_7$ ,  $^{25}/_7$ ,  $^{26}/_7$ ); a fifth specimen from the same locality is caught the  $^{13}/_8$  1905, and a quite young specimen measuring only 20 cm. is labelled  $^{11}/_8$  1905.

One specimen with small white dots forming crossbands crossbars from Ngare na nyuki in the Meru steppe.

A small specimen, without locality, probably Kibonoto 1906.

***Psammophis subtaeniatus* (PETERS). BOULENGER.**

*Psammophis subtaeniatus* (PETERS). BOULENGER, Cat. Snakes III p. 160.

1 specimen from the acacia forests at the river Ngare na nyuki in the Meru steppe, Jan. 1906.

Not only this but also three other related species of this genus have been recorded for Kilimandjaro before.

***Thelotornis kirtlandii* (HALLOW).**

*Thelotornis kirtlandii* (HALLOW). BOULENGER, Cat. Snakes III p. 185.

2 specimens from Kibonoto both collected in August 1905; a third from the same locality is labelled with another date  $\frac{6}{4}$  1906.

This snake is often found in shadowy shrubberies where it looks almost like a dry twig when it rests, quite immovable.

***Aparallactus jacksonii* (GÜNTHER).**

*Aparallactus jacksonii* (GÜNTHER). BOULENGER, Cat. Snakes III p. 256.

1 small specimen caught in Nov. 1905 in the acacia forests at the river Ngare na nyuki appears to belong to this species.

***Aparallactus concolor* (FISCHER).**

*Aparallactus concolor* (FISCHER). BOULENGER, Cat. Snakes III p. 257.

1 specimen from Usambara, June 1905.

Both these species have been described from Kilimandjaro.

***Elapechis guentheri* (BOCAGE).**

*Elapechis guentheri* (BOCAGE). BOULENGER, Cat. Snakes III p. 359.

1 specimen from Kibonoto collected  $\frac{27}{7}$  1905.

***Naja melanoleuca* HALLOW.**

*Naja melanoleuca* (HALLOW). BOULENGER, Cat. Snakes III p. 376.

A young specimen from Kibonoto caught the 10th of July 1905, had swallowed a specimen of *Chlorophis* which was actually longer than the *Naja*. The tail end of the *Chlorophis* still hung outside the mouth of the *Naja* but the greater part was swallowed and forced into undulatory coils in the digestive canal of the *Naja*.



**Dendraspis angusticeps (SMITH).**

*Dendraspis angusticeps* (SMITH). BOULENGER Cat. Snakes III p. 437.

6 specimens from Kibonoto, one caught in May, one  $^{21}/_7$ , one  $^{30}/_7$ , one  $^8/_8$ , one  $^{17}/_8$  and one without date. In five of these there are only 3 scales between the upper posterior temporal, and behind the parietals; in one of them one of these scales, or small plates, is, however, semidivided. In the fifth specimen the upper posterior temporal is separated from its fellow of the other side by 5 small scales.

A seventh specimen had no label indicating where it had been collected but was, no doubt, also from Kibonoto.

**Dendraspis sjöstedti n. sp.**

(Pl. 1 fig. 2.)

A specimen of *Dendraspis* from Kibonoto differs from all the others in several respects and at the same time from the descriptions of hitherto known forms as well. The most striking difference is the length and the narrowness of the frontal, the arrangement of the temporals etc.

Rostral broader than deep. Internasals short, their length contained about  $1\frac{3}{4}$  times in the length of the præfrontals. Frontal long and comparatively narrow, its width being contained  $1\frac{1}{3}$  in its length, it is nevertheless shorter than its distance from the end of the snout, and than the parietals. Two præoculars, the upper not in contact with the frontal; a subocular wedged in between lower præocular and third and fourth labials. Three or four postoculars (the lower of which may be termed subocular). Two anterior temporals, behind the upper of these a second upper temporal largely in contact with the parietal; this second upper temporal is very large so that it is separated from its fellow only by a single occipital shield, and from the labials by a single posterior lower temporal (temporals thus 2 + 2). 8 upper labials on one, 9 on the other side, fourth entering the eye, second and third much deeper than first and in contact with præfrontal. Three lower labials in contact with anterior chin-shields which are about as long as the posterior. Scales in 19 rows, outer not shorter than dorsals. Ventrals 227, an divided. subcaudals 102.

The colour appears to be uniformly green.

It is of course difficult to say if this single specimen represents a different species or only a remarkable individual aberration of *D. angusticeps*, but as the distinctness is so clear I have preferred to name it.

**Fam. Viperidae.*****Causus rhombeatus* (LICHTENSTEIN).**

*Causus rhombeatus* (LICHTENSTEIN). BOULENGER Cat. Snakes III p. 467.

6 specimens from Kibonoto, one caught the  $^{27}/_7$ , the others in August 1905. In one of the specimens the angle formed by the upper end of the rostral is less than a right angle.

2 small specimens about 27 cm. were caught at Kibonoto resp.  $^{10}/_8$  and  $^{15}/_8$  1905. 3 more specimens were collected at Ngare na nyuki, in Meru low lands.

***Bitis arietans* (MERREM).**

*Bitis arietans* (MERREM). BOULENGER Cat. Snakes III p. 493.

2 specimens from Kibonoto collected the  $^{27}/_7$  and  $^2/_8$  1905. — 1 fine specimen from Leitokitok, northern side of Kilimandjaro on a steppe with scattered acacias, end of May 1905. — 1 specimen killed a few days later.

## List of species of Reptiles hitherto known from the Kilimandjaro-Meru district.

### Chelonia.

1. *Testudo pardalis* BELL.
2. *Pelomedusa galeata* (SCHÖEPE).

### Lacertilia.

#### Geckonidae.

1. *Gonatodes africanus* (WERNER).
2. *Hemidactylus werneri* TORNIER.
3. *Lygodactylus picturatus* MATSCHE.

#### Agamidae.

4. *Agama doriae* BOULENGER.
5. *Agama planiceps* PETERS.
6. *Agama atricollis* SMITH.

#### Varanidae.

7. *Varanus ocellatus* RÜPPELL.
8. *Varanus niloticus* LINNÉ.

#### Lacertidae.

9. *Lacerta jacksoni* BOULENGER (subsp. *kibonotensis* LÖNNBERG).
10. *Latastia longicaudata* (REUSS).
11. *Nucras tessellata* (SMITH).
12. *Eremias speki* GÜNTHER.

#### Gerrhosauridae.

13. *Gerrhosaurus nigrolineatus* HALLOW.
14. *Gerrhosaurus flavigularis* WIEGMANN.  
*Gerrhosaurus flavigularis* forma *intermedia*.

#### Scincidae.

15. *Mabuia megalura* (PETERS).
16. *Mabuia varia* (PETERS).
17. *Mabuia striata* (PETERS).
18. *Lygosoma modestum* (GÜNTHER).
19. *Lygosoma kilimensa* (STEINEGER).
20. *Ablepharus wahlbergi* A. SMITH.

#### Rhoptoglossa.

#### Chameleontidae.

21. *Chamaeleon gracilis* HALLOW.
22. *Chamaeleon dilepis* LEACH.

23. *Chamaeleon biteniatus* FISCHER.
24. *Chamaeleon larensis* STEINDACHNER.

### Ophidia.

#### Typhlopidae.

1. *Typhlops punctatus* (LEACH).

#### Glauconidae.

- <sup>1</sup>3. *Glauconia conjuncta* SMITH.
4. *Glauconia scutifrons* PETERS.

#### Boidae.

5. *Python sebae* (GMELIN).

#### Colubridae.

- <sup>1</sup>6. *Tropidonotus olivaceus* PETERS.
7. *Boodon lineatus* (DUM. & BIER.)
8. *Lycophidium capense* (SMITH).
- <sup>1</sup>9. *Lycophidium jacksoni* BOULENGER.
10. *Chlorophis neglectus* (PETERS).
11. *Philothamnus semivariegatus* (SMITH).
- <sup>1</sup>12. *Coronella semiornata* (PETERS).
- <sup>1</sup>13. *Homalosoma lutrix* (LINNÉ).
14. *Dasypeltis scabra* (LINNÉ).
15. *Leptodira hotambela* LAURENTI.
- <sup>1</sup>16. *Amphorhinus nototania* (GÜNTHER).
- <sup>1</sup>17. *Rhamphiophis rubropunctatus* (FISCHER).
18. *Psammophis subcinctus* (PETERS) BLGR
- <sup>1</sup>19. *Psammophis punctulatus* (DUM. & BIER.)
- <sup>1</sup>20. *Psammophis sibilans* (LINNÉ).
- <sup>1</sup>21. *Psammophis biserialis* PETERS.
22. *Thelotornis kirilandi* (HALLOW).
23. *Aparallactus jacksoni* (GÜNTHER).
24. *Aparallactus concolor* (FISCHER).
25. *Elaeochis guentheri* (BOCAGE).
26. *Naja melanoleuca* (HALLOW).
- <sup>1</sup>27. *Naja nigricollis* REINHARDT.
28. *Dendraspis angusticeps* (SMITH).
29. *Dendraspis sjöstedti* LÖNNBERG.

#### Viperidae.

30. *Causus rhombatus* (LICHTENSTEIN).
31. *Bitis arietans* (MERREM).

<sup>1</sup> Not represented in present collection.

## BATRACHIA.

In Professor YNGVE SJÖSTEDT'S collection of Batrachia 21 species are represented by 398 specimens and some tadpoles. The fauna of German East Africa numbered before this about 33—37 species of Batrachia Salientia — an exact number cannot be stated, as it depends upon, how many »species» of *Rappia* are admitted. Through this collection not less than six species are added as new to the fauna of German East Africa; and one of these is entirely new. One of the other novelties *Rana fusigula* is widely distributed in West and South Africa, one *Phrynobatrachus ranoides* was before known from Natal, two, viz. *Arthroleptis minutus* and *A. bottegi*, have been described from the Somaliland and the last *Hylambates johnstoni* from Northern Nyassa land. There are certainly still many additions of Batrachia to be expected before the fauna of East Africa is thoroughly known. If the specifically uncertain *Rappia* are left out, it will be found that the greatest part of the others are very widely distributed on the dark continent. Not less than 9 species are found practically all over Africa, as well in its western and southern parts as in its eastern, 9 (perhaps 10) are found both in West and East Africa, and 5 are common to South and East Africa. The remaining ones belong, as far as hitherto is known, to the East African subregion but some of them are very widely distributed within the same. Three species (*Phrynobatrachus acridoides*, *Arthroleptis minutus* and *A. bottegi*) extend, for instance, in northeasterly direction into Somaliland. Others have been found partly at the coast and partly far in the interior. It is therefore difficult to decide whether any, or how many species of Batrachia may be regarded as endemic and exclusively confined to this country. In some cases only a few specimens have been found and the knowledge is thus scanty about such species. German East Africa as a whole, is not a zoogeographical unit and may therefore hardly be expected to include many endemic Batrachia. There is, however, a possibility that the great mountains Kilimandjaro and Meru may be inhabited by endemic species, and it seems even probable that the new species of *Rana*, described below, will prove to be such a one.

The batrachian fauna of the Kilimandjaro-Meru district was very little known before, only a few species of *Rana* having been recorded. By Professor SJÖSTEDT'S collection the number of species from this district is at once increased to 17, most of which have a very wide distribution, strange to say.

***Rana adspersa* (BIBRON).***Rana adspersa* BIBRON. BOULENGER Cat. Batrachia Sal. p. 33.

(Pl. 1 fig. 3 a &amp; 3 b.)

2 large and 3 small specimens from Tanga <sup>10</sup>/<sub>6</sub> 1905. — 1 small specimen Tanga <sup>8</sup>/<sub>6</sub> 1905.

One of the larger of these specimens is figured on the accompanying plate fig. 3 a. and b.

It has a rather characteristic but not exactly ranoid appearance.

***Rana merumoutana* n. sp.**

(Pl. 1 fig. 4 a &amp; 4 b.)

Vomerine teeth in two transverse but somewhat oblique rows, beginning almost on a level with the front-edge of the choanæ and with their inner ends which are directed a little backwards, not reaching on a level with the middle of the choanæ. Greatest posterior breadth of head about equal to <sup>3</sup>/<sub>4</sub> of its length. Canthus rostralis indistinct. Snout rounded very little projecting much longer than the orbit. Loreal region concave. Nostril about equally distant from eye and tip of snout. Interorbital space nearly twice as broad as upper eyelid. Tympanum distinct, its diameter about one half the diameter of the eye. Fingers pointed, long, second longer than first, fourth longer than second, third much the longest. Toes very long and slender, pointed, not webbed, the web being confined to the metatarsals. Distance from tarsal joint to tip of longest toe equal to the distance from snout to vent. A rather small metatarsal tubercle. Length of tibia equal to <sup>2</sup>/<sub>3</sub> of the length of the foot from the tarsal joint, and about equal to the fore limb; tibio-tarsal articulation reaching far beyond the snout. Skin smooth, dark brownish grey above. A black band from nostril over eye and tympanum to forelimb; another irregular band from axilla to groin. Flanks grey, some dark spots across forearm and tibia. Under parts white almost unspotted but lips dark brown.

One specimen from the Meru mountain 3,000 m. above the sea, caught the 21st of Dec. 1905.

***Rana fuscigula* DUM. & BIBR.***Rana fuscigula* DUM. & BIBR. BOULENGER Cat. Batr. Sal. p. 50.

6 specimens from Meru rain-forest 3,000 m. above the sea level, <sup>21</sup>/<sub>12</sub>—<sup>24</sup>/<sub>12</sub> 1905. — 1 specimen from the same locality although caught higher up, between 3,500 and 4,000 m.

All these specimens are young and thus not so easily recognized, but I have had the pleasure of consulting Dr G. A. BOULENGER about them and he has kindly told me that they are to be regarded as representatives of *Rana fuscigula*. The web on the hind feet is rather deeply emarginate. The lower side of some specimens is spotted, marmorated with dark all over, while in some others it is unspotted with the exception of the lower jaw.

This species is not recorded by TORNIER from German East Africa<sup>1</sup> but by BOULENGER from Northern Nyassa land.<sup>2</sup>

**Rana angolensis** BOCAGE.

*Rana angolensis* BOCAGE. BOULENGER Cat. Batr. Sal. p. 50.

A great number (59) of young frogs and tadpoles from a rivulet with a pond having a vegetation of *Nymphæa*, *Potamogeton* etc., the Kibonoto steppe, <sup>21</sup>/<sub>9</sub> 1905. Some tadpoles and 6 young frogs, Kibonoto, Dec. 1905.

The young frogs have acquired the characteristic spots on the back already before they have lost the last stump of the tail. The tadpoles have on their tails large round spots of a brownish black colour on light ground.

Two young but fully metamorphosed frogs from the upper rain-forest (Regenwald) of the Meru mountain, 3,000—3,500 m. caught the <sup>29</sup>/<sub>1</sub> 1906 belong to this species but I am uncertain concerning some tadpoles from the same locality as they are not coloured as those mentioned above from Kibonoto.

1 young frog and some tadpoles from a rivulet, tributary to the river Sanya, Kibonoto, <sup>28</sup>/<sub>2</sub> 1906.

1 large specimen from Fugga river, Kibonoto, <sup>7</sup>/<sub>9</sub> 1905. This specimen was caught with a net while it was sitting on the bottom in a depth of  $\frac{1}{2}$  m. and the water was cold as in a spring. In consequence of its age and size, about 9 cm. from snout to vent, the colour pattern of this specimen is less defined and it looks almost uniformly brown above with indistinct light marmoration, especially on the sides.

This frog has been collected at Kilimandjaro before, even above the forest region by VOLKENS.

**Rana oxyrhyncha** (SUNDEVALL) SMITH.

*Rana oxyrhynchus* (SUNDEV.) SMITH. BOULENGER Cat. Batr. Sal. p. 51.

2 specimens from Fugga river, Kilimandjaro, Kibonoto, <sup>6</sup>/<sub>9</sub> 1905. — 1 specimen caught near the Natron lakes, Kilimandjaro steppe, <sup>13</sup>/<sub>7</sub> 1905. — 3 specimens from a rivulet with clear water and a pond with *Nymphæa*, *Potamogeton* and other vegetation, the Kibonoto steppe <sup>21</sup>/<sub>9</sub> 1905. — 6 specimens from Kibonoto <sup>6</sup>/<sub>9</sub> 1905. — 2 specimens from Kibonoto, May 1906. — 1 specimen from Ngare na nyuki, Meru steppe. — 1 specimen from the Mkulumusi caves near Tanga, July 1905.

**Rana mascareniensis** DUM. & BIBR.

*Rana mascareniensis* DUM. & BIBR. BOULENGER Cat. Batr. Sal. p. 52.

1 specimen <sup>2</sup>/<sub>8</sub> Kibonoto. — 3 specimens from the shores of the Natron lakes, Kilimandjaro steppe <sup>9</sup>/<sub>7</sub> 1905. — Twenty specimens from a rivulet with clear water and a pond with *Nymphæa*, *Potamogeton* and other vegetation, the Kibonoto steppe

<sup>1</sup> Thierwelt Ost-Afrikas & Arch. Naturgesch. Jahrg. 63. Bd. I.

<sup>2</sup> Proc. Zool. Soc. 1897 p. 801.

<sup>21</sup>/<sub>9</sub> 1905. — 1 specimen Dec. 1905, Kibonoto. — 3 small specimens <sup>6</sup>/<sub>9</sub> 1905, Kibonoto. — 1 specimen June 1905, Mombo, Usambara. — 1 specimen from a rivulet, tributary to the river Sanya, Kibonoto, <sup>28</sup>/<sub>2</sub> 1906.

Concerning this frog SJÖSTEDT has communicated from his diary the following. »This is the most common frog of the district and is especially incredibly numerous on the low lands round the Natron lakes between Kilimandjaro and Meru and at the rivers and rivulets there. They sit often in the grass on land some way off from the water and take very long leaps. Very quickly it makes a long jump out from the grass and dives down again in the same but as a rule it does not stay but continues its jumping further away to seek shelter and safety. If it is near the water it takes some long leaps and disappears like an arrow in the same. In some places they are literally swarming and form the main food of many of the birds frequenting these lakes in great numbers.»

***Phrynobatrachus natalensis* (SMITH).**

*Phrynobatrachus natalensis* (SMITH). BOULENGER Cat. Batr. Sal. p. 112.

84 specimens from a rivulet with clear water and a pond with *Nymphaea*, *Potamogeton* and other vegetation, the Kibonoto steppe <sup>21</sup>/<sub>9</sub> 1905.

9 of these specimens had a light dorsal stripe which was either broad and brownish or narrow and whitish. Otherwise they were similar to the other specimens.

1 specimen from Ngare na nyuki. — 1 specimen from Kibonoto <sup>6</sup>/<sub>9</sub> 1905. — 3 specimens caught near the Natron lakes <sup>19</sup>/<sub>7</sub> 1905. — 1 specimen from Kibonoto, May 1906. — 4 specimens from the Mkulumusi caves near Tanga, July 1906.

***Phrynobatrachus acridoides* (COPE).**

*Phrynobatrachus acridoides* (COPE). BOULENGER Cat. Batr. Sal. p. 113.

1 specimen from Mombo, June 1906.

***Phrynobatrachus ranoides* BOULENGER.**

*Phrynobatrachus ranoides* BOULENGER. Proc. Zool. Soc. 1894 p. 644.

1 specimen from Kibonoto.

This species was originally described from Pietermaritzburg, Natal 1894.

The second tarsal tubercle under the heel is very characteristic for this species.

***Arthroleptis minutus* BOULENGER.**

*Arthroleptis minutus* BOULENGER. Proc. Zool. Soc. 1895 p. 539. Pl. XXX fig. 4.

5 specimens Kibonoto <sup>6</sup>/<sub>9</sub> 1905.

BOULENGER has kindly compared one of these specimens, which was remitted to him with the type-specimen and confirmed the identification. These specimens have all of them two metatarsal and a tarsal tubercle. The vertebral stripe is present in

all, and is either narrow and whitish, or broader and then pale brown. The lower side is more or less speckled with brown.

This species was originally established by BOULENGER 1895 on a small specimen from Western Somali-land. Its known geographical distribution has thus been extended a great deal by this find at Kibonoto.

**Arthroleptis bottegi** BOULENGER.

*Arthroleptis bottegi* BOULENGER. Ann. Mus. Civ. Stor. Nat. Genoa (2) Vol. XV p. 16  
Pl. IV, fig 3.

9 specimens from Kibonoto, Nov. 1905.

I owe my best thanks to my friend Dr G. A. BOULENGER, who has kindly determined this species and compared it with the type-specimen from Somali land.

**Arthroleptis stenodactylus** PFEFFER.

*Arthroleptis stenodactylus* PFEFFER. Jahrb. Hamb. wiss. Anst. Jahrg. X  
Hamburg 1892 (3), p. 15, Taf. I, fig. 11.

6 specimens from Mombo, Usambara, June 1906.

These specimens agree with PFEFFER'S description (1893) except that they being well preserved, have no (through contraction in the spirit produced) dermal folds. The black tympanic spot is as a rule extended over the eye to the snout. The black round spots in the inguinal tract and at the shoulder are not constant but only present in some specimens. The sternal tract is marmorated across with blackish. There is no conical papilla on the tongue. By this characteristic it is distinguished from *Arthroleptis whytii* BOULENGER 1897<sup>1</sup> with which it agrees very closely as well with regard to the description as to the figure.

**Rappia marmorata** (RAPP).

(Pl. I fig. 5).

*Rappia marmorata* (RAPP). BOULENGER Cat. Batr. Sal. p. 121

18 specimens from Kibonoto. — 1 specimen found sitting on a rock on the Massai steppe and agreeing in colour with the rock, Kibonoto <sup>8</sup>/<sub>9</sub> 1905. — 2 specimens in a pond through which a rivulet with clear water ran, which emptied into the river Sanya, the Kibonoto steppe <sup>22</sup>/<sub>9</sub> 1905. The frogs sat on the floating leaves of *Nymphaea*. — 1 specimen Kibonoto Nov. 1905. — 2 specimens from a rivulet, tributary to the river Sanya <sup>28</sup>/<sub>2</sub> 1906.

It is extremely difficult to form any opinion as to which »species» some specimens of *Rappia* belong. Characteristics derived as well from the colour as from the dimensions of certain parts of the body appear to be very variable. This is also the case with the specimens enumerated above, but I think, however, that they must be

<sup>1</sup> Proc. Zool. Soc. 1897, p. 802 Pl. XLVI fig. 3.



named as above till our knowledge of these animals has increased sufficiently to enable a suitable and natural arrangement of the different varieties.

The present specimens are partly uniformly coloured, partly spotted. The latter have, as a rule, no regular pattern for the arrangement of the light spots. In most cases, however, the light spots have a dark centre, and as no such specimen is represented in TÖRNIER'S large series of colour-pattern of *Rappia*<sup>1</sup> a figure of such a specimen is represented on the accompanying plate (fig. 5).

The males have an adhesive disk.

*Rappia puncticulata* PFEFFER.

*Rappia puncticulata* PFEFFER. Jahrb. Hamb. wiss. Anst. Jahrg. X.  
Hamburg 1892 (3) p. 31. Taf. II fig. 2.

Numerous (64) young specimens caught with an insect net swept through grass, rushes (*Scirpus* etc.) round pools on the Massai steppe, Kibonoto, <sup>28</sup>/<sub>9</sub> 1905. — 1 specimen <sup>25</sup>/<sub>7</sub> 1905, Kibonoto. — 4 specimens May 1906, Kibonoto. — 1 rather large specimen May 1906, Kibonoto.

*Megalixalus fornasinii* (BIANCONI).

*Megalixalus fornasinii* (BIANCONI). BOULENGER, Cat. Batr. Sal. p. 130.

1 specimen from Mombo, June 1906.

This species is also recorded from Cameroon.

*Cassina senegalensis* (DUM. & BIBR.)

*Cassina senegalensis* (DUM. & BIBR.) BOULENGER, Cat. Batr. Sal. p. 131.

3 specimens, Kibonoto, <sup>6</sup>/<sub>9</sub> 1905. — 1 specimen found under rotten and moist banana leaves in a farm, Kibonoto, <sup>5</sup>/<sub>8</sub> 1905. — 1 specimen under a stone on the Massai steppe, Kibonoto <sup>28</sup>/<sub>8</sub> 1905. — 4 specimens, Kibonoto, Nov. 1905. — 1 specimen from a rivulet, tributary to the river Sanya, Kibonoto, <sup>28</sup>/<sub>2</sub> 1906.

All these specimens are females and in all of them the vomerine teeth, are very little developed but otherwise they are typical in every respect.

*Hylambates johnstoni* BOULENGER.

*Hylambates johnstoni* BOULENGER. Proc. Soc. 1897 p. 803. Pl. XLVI.

3 specimens from Mombo, Usambara, June 1906.

This species was originally described from Northern Nyassa land.

*Hemismus sudanense* STEINDACHNER.

*Hemismus sudanense* STEINDACHNER. BOULENGER, Cat. Batr. Sal. p. 178.

1 specimen Dec. 1905, Kibonoto.

<sup>1</sup> Die Thierwelt Ost-Afrikas: Rept. u. Amphib. Taf. IV.

Sjöstedts Kilimandjaro-Meru Expedition. 4.



**Bufo regularis** REUSS.

*Bufo regularis* REUSS. BOULENGER, Cat. Batr. Sal. p. 298.

1 specimen <sup>4</sup> 1905 Kibonoto. — 1 specimen <sup>7</sup> 1905 Kibonoto. — 12 specimens <sup>2</sup> 1905 Kibonoto. — 1 specimen May 1906 Kibonoto. — 3 specimens Ngare na nyuki, Meru steppe, 1905. — 1 specimen Mombo, Usambara, June 1906.

Often hiding deep under dry leaves.»

Concerning the habits of this toad Professor SJÖSTEDT has made the following communication from his diary:

«The 26th of July 1905 I sat in the workingroom at Kibonoto (1,300 m. above the sea). The sun had set long ago and only the screams of *Galago crassicaudatus* and the noise from the crickets broke sometimes the silence of the night. Then at once some peculiar sounds were heard which resembled the drumming on a dry tree trunk or reiterated snorings of a sleeping man. To begin with weaker and with intervals, but soon more intense and more continuous. I got interested and wanted to make sure whether, as I believed, toads produced these sounds. I lighted an acetylen lantern and went with some negroes, passing the Massai craal, down towards the farm. With every step the noise became stronger, the »snoring» and »drumming» increased. It soon became evident that the sound came from a dug up pond not far off and we went there. In this great »pot» there was an almost ghastly concert. All around its borders, which were partly concealed by the overhanging brims, it snored, clattered, and drummed most awfully hollow. The coarser and finer sounds succeeded in a certain tempo as the snoring sounds at the time of ex- or inspiration. When the light was reflected in the pond several spotted toads were seen floating at the surface, others embracing each other swam round or dived down in the muddy water. But it was, as already mentioned, from the, by overhanging grass partly concealed, borders of the pond that the loud music came. The lantern was directed towards this border and, when the overhanging long grass had been put aside, the sharp light made long rows of toads visible. They had partly or completely crawled up out of the water and gave vent to their music most heartily. The throat was inflated to a great light coloured vesicle in which the air seemed to work as in a bag-pipe. Without being disturbed by the light they continued their concert clattering almost as storks. The fore feet with the fingers spread rested on the red earth. The anterior part of the body was elevated but the hind part often remained in the water. Very soon one after the other of the animals was caught in the dip-net and then put in the cistern with spirit but the remaining did not cease to make music. — — — — —

Still at 7 o'clock in the morning, thus about one hour after sunrise, some single croaks were heard but they too became silent by and by.»

Three small specimens from Tanga <sup>4</sup> 1905, and one specimen from Meru rain forest 3,000 m. above the sea <sup>21</sup> 1905 have the tympanum hidden but agree otherwise perfectly with *Bufo regularis* and I think they only represent varieties of this species.

***Xenopus laevis* (DAUDIN).**

*Xenopus laevis* (DAUDIN). BOULENGER, Cat. Batr. Sal. p. 456.

1 specimen from Kibonoto July—Aug. 1905. — 6 specimens from the Natron lakes between N. W. Kibonoto and Meru <sup>7</sup>/<sub>7</sub> 1905. — Several stages of larval development from the Natron lakes between Kilimandjaro and Meru, <sup>19</sup>/<sub>7</sub> 1905. — 2 specimens from a rivulet with clear water and a pond with *Nymphaea*, *Potamogeton*, and other vegetation, the Kibonoto steppe <sup>21</sup>/<sub>9</sub> 1905. Yellowish beneath, especially posteriorly and with roundish brown spots. — 1 specimen from the river Ngare na nyuki, Meru steppe 1906.

***Xenopus mülleri* PETERS.**

*Xenopus mülleri* PETERS. BOULENGER, Cat. Batr. Sal. p. 457.

9 specimens from pools and ponds in a farm, Tanga <sup>4</sup>/<sub>6</sub> 1905. Several larvæ probably of the same from the same locality.

### List of Batrachians hitherto known from the Kilimandjaro-Meru district.

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|---|--|
| 1. <i>Rana adpersa</i> (BIBRON).              | 10. <i>Arthroleptis minutus</i> BOULENGER.     |
| 2. <i>Rana merumontana</i> LÖNNBERG.          | 11. <i>Arthroleptis bottegi</i> BOULENGER.     |
| 3. <i>Rana fuscigula</i> DUM. & BIBR.         | 12. <i>Rappia marmorata</i> (RAPP).            |
| 4. <i>Rana angolensis</i> BOUAGÉ.             | 13. <i>Rappia puncticulata</i> PFEFFER.        |
| 5. <i>Rana oxyrhyncha</i> (SUNDEVALL) SMITH.  | 14. <i>Cassina senegalensis</i> (DUM. & BIBR.) |
| 6. <i>Rana mascareniensis</i> DUM. & BIBR.    | 15. <i>Hemisus sudanense</i> STEINDACHNER.     |
| 7. <i>Rana braruna</i> (PETERS). <sup>1</sup> | 16. <i>Bufo regularis</i> REUSS.               |
| 8. <i>Phrynobatrachus natalensis</i> (SMITH). | 17. <i>Xenopus taris</i> (DAUDIN).             |
| 9. <i>Phrynobatrachus ranoides</i> BOULENGER. |  |

<sup>1</sup> Not found by SJÖSTEDT.

### Explanation of Plate.

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|--|---|
| Fig. 1 a. Head of <i>Gerrhosaurus flavigularis</i> forma<br><i>intermedia</i> seen from above. | Fig. 3 b. Head of the same.                                     |
| 1 b. The same from side.   | 4 a. <i>Rana merumontana</i> n. sp.                             |
| 2 Head of <i>Dendraspis sjöstedti</i> n. sp.   | 4 b. Head of the same.  |
| 3 a. <i>Rana adpersa</i> BIBRON from Tanga.  | 5 <i>Rappia marmorata</i> to show a peculiar<br>colour pattern. |

